REMARKS/ARGUMENTS

Minor changes are made to this specification. Claims 4-6 and 9-10 are canceled without prejudice. New claim 22 has been added. Claims 1-3, 7, 11-15, 17, and 20 have been amended. Claims 1, 11, and 17 are the independent claims. Claims 1-3, 7-8, and 11-22 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

CLAIM REJECTION UNDER 35 U.S.C. § 102(e)

Claims 1-21 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over Sabia (U.S. Application No. 2003/0206347). Claims 4-16 and 9-10 have been canceled. Applicant respectfully traverse the above rejection of claims 1-3, 7-8, and 11-21 in view of the clarifying amendments above.

AMENDED INDEPENDENT CLAIM 1 IS PATENTABLE OVER SABIA

The present invention is directed to a method for manufacturing an optical isolator having a Faraday rotator and polarizer. The amended independent claim 1 of present invention is recited below:

"An optical isolator element, comprising:

at least one flat Faraday rotator, and

at least two flat polarizers,

wherein the Faraday rotator and the polarizers are bonded to

each other by van der Waals forces acting between

bonding surfaces thereof,

with the boding surfaces being brought into contact with each other while the bonding surfaces are activated such that atom bonds are present thereon."

The applied reference is not seen to disclose or suggest the above features of the present invention as defined by amended independent claim 1. Sabia is directed to an optical isolator manufactured by direct bonding of parts. (*See, Sabia; Abstract*). In particular, Sabia discloses having lithium on the bonding surfaces. (*See, Sabia; Para. 12, 30*). Moreover, Sabia discloses a method of hydrogen bonding the Faraday rotator and polarizer. According to Sabia, a high pH solution is provided on the bonding surfaces. The Faraday rotator and polarizer are then bonded. Heat is provided after bonding. (*See, Sabia; Para. 25, 26*).

One aspect of the present invention is that the Faraday rotator and polarizer are bonded with each other directly, i.e. without intervention of a molecule or atom of third material, and without chemical reaction of the material on the surface of the Faraday rotator and polarizer. This direct bonding is shown in Figure 5 of Specification, and more particularly in the lower two drawings, where the atom 32 and 33 are bonded without processing at high temperature. The interface of the bonding has a structure which is the same as that of the bulk. (*See Specification; Page 19, line 15 – Page 20, line13*).

In contrast, the optical elements of the references are bonded with each other with atoms of a intervening medium such as hydrogen, oxygen, carbon, or the like. Alternatively, they are bonded by chemical reaction of the surfaces.

Claim 1 is amended to clarify that the Faraday rotator and the polarizers are bonded to each other with the bonding surfaces being brought into close contact with each other while the bonding surfaces are activated such that atom bonds are

present. Support of this feature is found in line 15 at page 19 to line 7 at Page 20 of Specification.

Sabia discloses optical isolator elements as indicated by the Examiner. However, none of the references shows the feature of the present invention as mentioned above. The reference shows direct bonding of a Faraday rotator and polarizers by vacuum bonding and chemical bonding. According to the vacuum bonding of the reference, it only shows that cleaned and flatten bonding surfaces are brought into contact with each other in vacuum, but it does not show the bonding of activated bonding surfaces with atom bonds.

Furthermore, the Sabia fails to discloses the method for producing an optical isolator elements as recited in claim 11, where the bonding surfaces are activated and brought into contact with each other at room temperature to be bonded with each other by the connection of atom bonds, The actual method for the activation is further defined in claim 22.

Accordingly, Sabia does not teach or suggest the features of present invention as recited in amended independent claim 1. Reconsideration and Withdrawal of rejection are thus respectfully requested.

Moreover, Sabia relies on U.S. Patent No. 6,153,495 (Kub), incorporated by reference, for vacuum bonding disclosure. (*See, Sabia; Para. 23*). Kub is directed to a method of direct bonding two semiconductor substrates in vacuum. (*See, Kub; Abstract*). In particular, Kub discloses etching the bonding surfaces before bonding (*See, Kub; Figure 1, Reference characters 60a and 60b; Col. 5, line 62 – Col. 6, line 15*). Plasma etching is cited by Kub as an example of methods of etching the bonding surfaces. (*See, Kub; Col. 6, lines 20-22*).

Kub discloses an optional additional step of implantation after etching the bonding surfaces. (*See, Kub; Figure 1, Reference characters 62a and 62b; Col. 6,*

lines 58-67). In contrast, the Specification of present invention discloses the bonds of the bonding surfaces are "very active" after the etching process. (*See, Specification; Page 16, lines 11-15*). The bonding surfaces should be bonded within as short a period as possible after the activating, in fear of impurities attached to the active bonds. (*See, Specification; Page 16, lines 14-21*).

In light of the foregoing, Applicant respectfully submits Sabia and Kub do not teach or suggest the above features of amended claim 1, and moreover teaches away from the same. As such, withdrawal of the above rejection and allowance of independent claim 1 are respectfully requested.

Claims 2, 3, 7, and 8 depend directly or indirectly from the amended independent claim 1, and are allowable for at least the same foregoing reasons as amended independent claim 1.

Moreover, Applicant respectfully submits the amended independent claim 11 reciting, "activating the bonding surfaces of the Faraday rotator and the polarizers such that atom bonds are present thereon," is patentable for the same reasons as amended independent claim 1.

Claims 12-16 and 22 depend directly from amended independent claim 11, and are allowable for at least the same foregoing reasons as amended independent claim 11.

Applicant notes that according to the method recited in amended inedendent claim 17, the bonding surfaces are smoothed by chemical mechanical polishing, which is explained in detail from line 3 to line 3 from the bottom at Page 4 of Specification.

Moreover, Applicant respectfully submits the amended independent claim 17 reciting, "activating the bonding surfaces of the Faraday rotator and the polarizers

such that atom bonds are present thereon," is patentable for the same reasons as amended independent claim 17.

Claims 18-21 depend directly from the amended independent claim 17, and are allowable for at least the same foregoing reasons as amended independent claim 17.

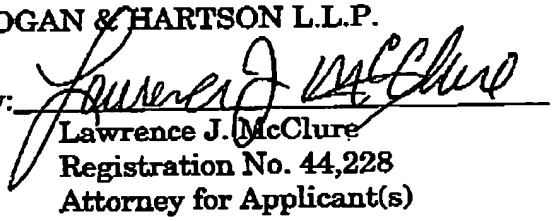
In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6810 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: September 14, 2005

By: 
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